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United States Navy
MEDICAL NEWS LETTER

Vol. 43

Friday, 1 May 1964

No. 9

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Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

An Unusual Case of Subacute Combined Degeneration

LT J. R. Warmolts, MC USN - Proceedings of the Monthly Staff Conferences of the U. S. Naval Hospital, NNMC, Bethesda, Md., 1961 - 1962.

In 1924 Jean Lhermitte (the French neurologist) described a sensation of electric discharge radiating down the vertebral column into the lower extremities upon head flexion as the presenting symptom in a case of multiple sclerosis. From similar cases collected by Lhermitte and others, the symptoms came to be regarded as diagnostic of multiple sclerosis, although the symptom had been earlier recognized in spinal cord concussion. However, in subsequent years the symptom was found to exist with tumors, Pott's disease, and other conditions involving the posterior columns of the cervical cord.

In 1932 two patients in the Cook County Hospital with frank signs and symptoms of subacute combined degeneration of the spinal cord complained of the Lhermitte phenomenon, one as an early symptom, the other (who did not have anemia) after a year of sphincter difficulties.

Although individual neurologists probably encountered similar cases in the ensuing years, additional case reports of the Lhermitte phenomenon in subacute combined degeneration have not been published. We should like to present a recent case from our service whose first indication of subacute combined degeneration was the Lhermitte phenomenon.

Case Summary

The patient is a thirty-two year old Caucasian male lieutenant, USN, who was admitted to the Neurology Service of the U. S. Naval Hospital, National Naval Medical Center, Bethesda, Maryland, on 2 November 1962. The patient gave a six week's history of a lightning-like sensation radiating down his spinal column on neck flexion or extension, and of a similar sensation radiating down the back of either leg on turning his head to the opposite side. These phenomena diminished with continued testing. For several weeks he experienced a pins and needles sensation over the medial aspect of both lower thighs and a bruised feeling over the skin of the toes and soles of the feet, that did not subside with exercise.

At the age of 8 the patient had been treated in a country clinic for anemia with what he believed to be "combined liver shots and vitamin B12 shots." Except for an additional history of an appendectomy his past history was unremarkable. The patient smokes a package of cigarettes a day but does not consume alcoholic beverages. He denied diplopia, blurred vision, tinnitus or vertigo, bladder or bowel disturbance. For several weeks he had had preprandial epigastric and substernal distress which responded to eating.

Examination showed a well developed, well nourished white male with a blood pressure of 138/80. Eyes, ears, nose and throat were within the

limits of normal. Heart and lungs were normal. The abdomen was soft and free of organomegaly; bowel sounds were normal. Point epigastric tenderness was present. Patchy areas of vitiligo were scattered over the trunk and extremities. Cranial nerves were intact. The sensory system including senses of position vibration and passive movement was normal. No areas of sensory loss in the distribution of the medial cutaneous nerves of the thighs or in the skin of the feet could be demonstrated. No evidence of dorsal column disease other than Lhermitte's symptom was present. The motor system was normal. Station and gait were normal. There were no pathological reflexes or signs, the deep tendon reflexes being easily elicited.

The patient's peripheral blood contained a hemoglobin of 13.3 grams with a hematocrit of 42 per cent. The white count was 7,900 with a normal differential. The corrected sedimentation rate was 10 millimeters per hour. BUN was 22 milligrams per cent. Fasting blood sugar was 96 milligrams per cent. A routine urinalysis was normal. Total serum protein was 7.4 grams per cent with a 5.3 grams per cent albumin fraction. Gastric analysis with a standard Ewald meal showed no free hydrochloric acid until the 1 to 2 hour specimens which contained from 7.5 to 9.5 units of free acid. Total acidity was highest in the one hour and fifteen minutes specimen, at twenty-six units. An upper GI series failed to demonstrate any mucosal pattern of the stomach. Peristaltic activity was vigorous and normal, although there was a moderate delay encountered in passage of barium through the pylorus. No evidence of peptic ulcer disease was present. No gastric masses were visualized. X-ray films of cervical and thoracic spine revealed no bony or soft tissue abnormalities. On the lumbosacral series there seemed to be a semilunar defect in the laminae of the upper portion of the sacrum on the AP and lateral projections. This density was suggestive of being outside the bone and containing fat. A cervical myelogram was normal.

The spinal fluid removed under normal pressure contained six lymphocytes per cubic millimeter and protein of 29 milligrams per cent. GLOBULIN was negative. Colloidal gold curve was flat; serology negative. Electrocardiogram was normal except for a non-specific T-wave abnormality. Gastroscopy visualized a paler-than-normal lower fundus of the stomach. The submucosal venous pattern was readily seen. Mucosal highlights were prominent. The picture was that of atrophy of the mucosa. A biopsy of the mid-portion of the stomach under fluoroscopic guidance was obtained with Ruben biopsy tube. The histologic picture was that of atrophy of gastric mucosa. Two standard Schilling tests performed with vitamin B12 tagged with Cobalt 57 demonstrated a twenty-four urine excretions of 1.9 and 1.4 per cent respectively. The test repeated with Vitamin B12 and two units of intrinsic factor raised the excretion to 12.1 per cent. These results were felt to be diagnostic of Addisonian (pernicious) anemia. Even prior to patient's receiving the test dosage of 3000 micrograms of vitamin B12 his Lhermitte's symptom and his thigh and his toe tingling had begun to subside. Therapy was continued with 60 micrograms of Vitamin B12 IM daily for ten days.

At the time of this report the patient complains only of mild tingling in the distribution of both medial cutaneous nerves of the thigh and in his toes, and of a mild radiating sensation down the back of both legs on head turning. No abnormal sensation is experienced on flexing the neck. It is the opinion of the Department of Neurology that the patient has subacute combined degeneration of the spinal cord, as a manifestation of pernicious anemia. Future gastric analysis using histamine stimulation is planned. Bone marrow specimens and microbiological assays of vitamin B12 in the serum were unfortunately not obtained prior to treatment.

Discussion

Subacute combined degeneration appears in 80% of pernicious anemia patients, usually presenting initially in the 4th to 6th decades of life. The neurological picture develops usually at the same time as the anemia; but may follow or precede anemia by months or years.

Subacute combined degeneration is now agreed to be related to B12 deficiency, and in pernicious anemia patients is secondary to a lack of gastric intrinsic factor necessary for intestinal absorption of Vitamin B12. Achlorhydria though usually present is no longer recognized as a prerequisite for pernicious anemia development or subacute combined degeneration.

The neurological disease consists of destruction of the spinal cord white matter and the spinal nerves. The cord involvement appears earliest in the dorsal columns, and later in the corticospinal tracts and to lesser degrees throughout the cord white matter. The brunt of the cord degeneration falls upon midthoracic levels, diminishing as it is traced upward to cervical levels where it is confined mostly to the dorsal columns, and downward to lumbar levels where the corticospinal tracts are the most affected. The lesions are formed from early fusiform swellings of the myelin sheaths followed by breakdown of the myelin into its lipid components and disappearance of the axons. A similar process affects the peripheral nerves.

In an untreated case, the following order of clinical features is typically observed. First, persistent, progressive, symmetrical numbness and tingling of the extremities, attributable to peripheral nerve changes; second, impairment of passive movement position and vibratory sense, initially in the lower extremities, and ataxia, referable to posterior column damage; third, deep tendon reflex increase depending upon the respective degrees of lateral column and posterior root disease, and perhaps Babinski signs; and fourth, loss of sphincter control. Mental symptoms such as memory impairment and irritability are frequent.

Without treatment, the neurological manifestations lead progressively and inevitably to death. With proper treatment with liver extract or preferably Vitamin B12, the neurological improvement lags behind the prompt hematological remission. The peripheral nerve symptoms improve rapidly; spinal cord manifestations remit quite slowly, and the more serious the spinal cord damage,

the less recovery is to be expected.

We feel that our case with the Lhermitte phenomenon as a symptom of subacute combined degeneration is unusual especially with its presentation before objective signs of neurological deficit.

* * * * *

Neuropsychiatric In-Patients: A Comparison of
1956 and 1961 Patient Populations

Captain S. V. Thompson MC, USN* - Proceedings of the Monthly Staff Conferences of the U. S. Naval Hospital, National Naval Medical Center, Bethesda, Md., 1961 - 1962.

This brief discussion will attempt to highlight certain trends observable in our Neuropsychiatric in-patient population at this hospital. For comparison, the patients admitted during the calendar year 1956 are contrasted with those admitted during the year 1961. The year 1956 was selected for two reasons: firstly, the physical plant for the Neuropsychiatric Service was the same then as for 1961; secondly, during the past five years the widespread introduction of multiple new drugs, especially the anti-depressants, for use in psychiatric diseases has produced some changes.

1. Admissions of active duty military personnel. In both years the number of active duty military personnel admitted to neuropsychiatry was approximately the same - 545 vs 541. However, the 1961 admissions were apparently sicker than the 1956 admissions as indicated by the following:

(a) There were three times as many psychotic diagnoses.

(b) In 1956 we were able to return to duty 53% of the admissions, while in 1961 only 40% of the admissions were returned to duty.

2. Admissions of dependents and retired military personnel. About 200 more patients were admitted to the Neuropsychiatric Service in 1961 than in 1956. This increase was entirely in the categories of dependents and retired military personnel. In 1956, 34% of our Neuropsychiatric admissions were dependents and retirees (66% active duty) while in 1961, 50% of our admissions were dependents and retirees. Obviously, if this trend continues, more provision must be made for emergency psychiatric care of these people. However, this is not the main problem in this group - the main problem arises when long-term hospitalization is necessary.

Let me illustrate with a capsule resume of a now quite common type of admission. A 60 year old MSGT USMC, retired in 1950 after 30 years of active duty, was admitted in November 1960. For five years he had exhibited

* Chief of the Neuropsychiatry Service of the hospital at the time of this presentation. Captain Thompson retired in August 1963; his current address is 500 West Montgomery Avenue, Rockville, Maryland.

progressive dementia of the type seen in early severe senility. The family had attempted to maintain him at home, at nursing homes, etc., without success. He was admitted as an emergency while permanent hospitalization could be arranged for at a State Hospital or at a Veterans Administration Hospital. Since he had established residence in no state, the state hospitals refused to accept him. Since his disability was not service connected, he was eligible for Veterans Administration hospitalization only on a bed available basis for non-service connected disability. Application was made for a V.A. bed. In 12 months his position on this bed available list had moved from about 498 to 494. We estimated that the V.A. would have a bed for him when he reached the age of 186 years.

3. The use of electro-shock therapy. In 1956, 27 patients received courses of electro-shock therapy, while in 1961 only 5 patients were given such treatment. The indications for electro-shock therapy occur mainly in the agitated depressions, and also acute schizophrenic reactions and manic states. Now, the patient population has continued to fit these indications - in fact the increase in admissions of dependents and retired personnel has been largely in the above mentioned diagnostic categories. In other words, by diagnoses and indications more patients were eligible for electro-shock treatments in 1961 than in 1956. The difference - the fact that fewer patients received shock treatments in 1961 - is due to the utilization of the "new" drugs, especially Parnate,* Tofranil, Librium, Stelazine, and Sparine.

4. The use of the "new" so-called miracle drugs. Our experience with the above mentioned drugs, as well as others too numerous to mention, confirms the claims that with their use less drastic therapy is needed, fewer patients have to be committed to V.A. Hospitals, St. Elizabeths, and State Hospitals, and the drugs do decrease the duration of hospitalization. They do not decrease the admission rate, they do not prevent recurrence of symptoms of mental illness, and they do not decrease the re-admission rate. Whether or not these drugs are producing any lasting change is open to considerable question. At best, all that can be said at present is that the antidepressants and potent tranquilizers are serving as stop-gap measures; that they serve as chemical restraints (chemical straitjackets); that less physical restraint is necessary, and that less drastic therapy in the form of electro-shock treatment is necessary.

These "new" drugs are not a complete blessing. There are three points which I would mention that are causing us more and more trouble.

(a) "Target symptoms" or "shotgun" prescriptions. In many areas, the general idea seems to be to elicit all possible symptoms, to consider each a target to be shot down by prescribing a specific drug. This concept is supported by much of the research and many of the reports regarding the effec-

* See "Notice of Drug Withdrawal" and "Important Drug Warnings" in USN Medical News Letter, Vol. 43, No. 7, pages 17, 18 and 19 of 3 April 1964.

tiveness of these drugs. The result, however, is that patients get loaded down with a great variety of drugs. Case in point: A 36 year old female dependent was admitted, disoriented, hallucinating, and agitated, with wild, rapid mood swings from deep depression to extreme elation. History of any degree of reliability was impossible to obtain. In going through her belongings, copious supplies of barbiturates, dexadrine, dexamyl, equanil, sparine, tofranil, librium, compazine, serpasil, vodka and gin were found. With this type of situation it takes at least two weeks to "dry out" the patient, and then comes the attempt to get some reliable notion as to the base line at which the patient operates and to get some idea as to what needs to be treated.

The "good old days" are gone forever - i. e. , when the only readily available tranquilizers or mood-elevators were alcoholic beverages. Now even our alcoholics present a clinical picture confused by multiple drug intake.

(b) The next troublesome point about the "new" drugs is the sense of false security that they give. These drugs are capable of masking many acute symptoms of mental illness. With the anti-depressants (Tofranil, the MAO inhibitors, etc.) acute depressive symptoms do seemingly disappear; with anti-hallucinogens, experiences of the schizophrenic patient also seemingly disappear. With the powerful tranquilizers agitation is brought under control. All too frequently the patient, his relatives, and his doctors are then lulled into a sense of false security and the patient signs out of the hospital, or is signed out AMA, or his doctor discharges him. It is this "false security" syndrome, resulting from the claims made for these drugs, and the temporary responses to them, which has caused an increase in readmissions.

In no condition is this better illustrated than in the alcoholic with DT's. In 1956 an alcoholic with impending DT's would come in with the refrain, "I'll never drink again if I live through this," or "Oh, God, don't let me have a convulsion." If he lived he frequently stayed around long enough to get completely dried out and to join Alcoholics Anonymous. In 1961 the alcoholic with impending DT's had the following refrain, "Let's get going on the Dilantin, Doc, so I won't have a fit - and the Librium to stop the shakes and so I won't have those hallucinations - and the IV fluids - I've got to get out of here next Friday to go to an important business party." He frequently makes his appointment - and is rehospitalized in a month and again in another month, and again in another month.

Are we doing our patient a favor by not permitting him the privilege of experiencing full blown DTs? What will we be seeing in another five years as results of massive tranquilization, of massive masking of symptoms of mental disease by chemical restraints, of massive use of mood elevators?

(c) One final point about the "new" drugs has to do with the increase seen during 1961 in the frequency of side-effects and/or complications. Mention here is made only of those seen with increased frequency.

1. Agitated depressions - accompanying usage of serpasil or reserpine.
2. Acute, severe Parkinsonian-like states - with compazine. This we have seen with small doses of this drug.

3. Severe cardio-vascular collapse - with Tofranil.
4. Acute toxic psychoses - alcohol combined with any of the tranquilizers (from meprobamate to sparine).

In summary, we have compared our 1956 and 1961 neuropsychiatric patient populations. A significant increase in admissions of dependents and retired military personnel has occurred. Less electro-shock therapy is in use. The "new" drugs have complicated our treatment when used in "shotgun" techniques, when they mask symptoms, giving a sense of false security, and with increasing use, increased complications and side effects.

* * * * *

New Type of Tube for Tracheotomy
with Inflatable Cuff and Inner Cannula

LCDR Frederick F. Jackson MC USN*, Dept of Neurosurgery, USNH, San Diego, Calif. Journal of Neurosurgery XX(9): 809, 1963.

The application of intermittent positive pressure breathing in the postoperative care of neurosurgical patients has been practiced more often during the past several years at the USNH, San Diego. It is the opinion of the author that postoperative atelectasis and pneumonitis have been prevented in many instances by the alveolar inflation induced by the positive pressure technic. The author is particularly well-pleased with intermittent positive pressure breathing in (1) the care of quadriplegia patients who do not have intercostal respiratory action and (2) the first 48 hours after any prolonged neurosurgical procedure.

When the Chevalier Jackson type of tracheotomy tube is used for intermittent positive pressure breathing adequate inflation of the alveoli is not possible, since air escapes from around the tube, a situation difficult or impossible to control sufficiently.

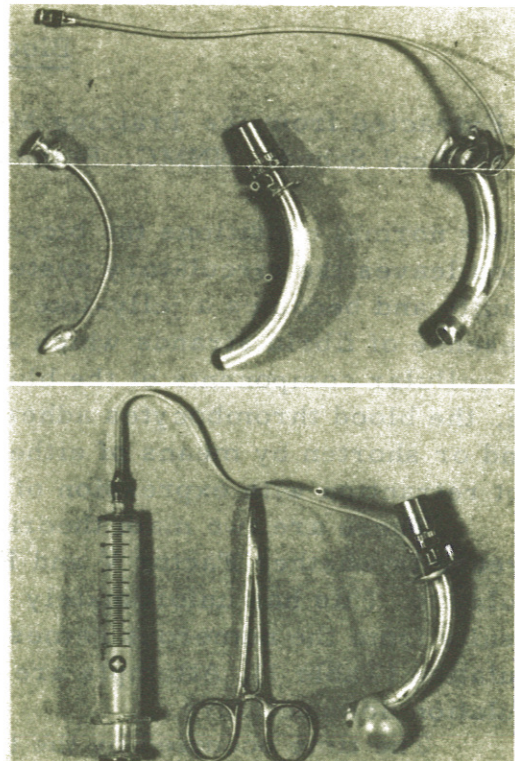


FIG. 1 (above) and FIG. 2 (below).

* Present address: U. S. Naval Hospital, Charleston, South Carolina.

A small cuff type tube for endotracheal anesthesia was tried. However, it was without an inner cannula—making it impossible to remove secretions formed on the inside.

Having the above difficulties in mind, the author developed the tracheotomy tube**, shown in Figures 1 and 2 (see pg 9), which has been given a good trial and found highly successful. It has an inner cannula for cleaning and an inflatable cuff for complete occlusion when intermittent positive pressure breathing is performed. It is customary to administer the latter procedure for 10 minutes every 2 hours with a respirator of the Byrd type, with an adapter to receive a standard Foregger size 15 adapter for anesthesia coupled permanently to the cannula for tracheotomy. Thus, the lumen is not diminished where the cannula and adapter join.

** Manufactured by "Instruments for Medicine," 1233 Opal Street, Pacific Beach, Calif. The assistance of the Department of Anesthesiology at the USNH, San Diego, and of HN Keller and HN Whitmore of the Inhalation Therapy Department and of the Hospital Instrument Shop is gratefully acknowledged.

* * * * *

Blood Coagulation

Extracted from the Training Manual, "Hematology,"* of the U. S. Naval Medical School, NNMC, Bethesda, Md.

Under normal conditions the blood clotting mechanism begins the moment the blood leaves the circulatory system. After 2 to 6 minutes the blood loses its fluidity and becomes a jelly-like clot. The jelly-like consistency is due to the presence of fibrin strands which are interlaced throughout the clot holding all the cellular components of the blood within their meshes. Upon further standing, the blood thrombocytes adhere to the fibrin strands and cause them to bend or shorten by means of either a physical or chemical reaction. This is clot retraction with expression of serum.

There are two main theories of blood coagulation, and the main difference is whether Factor V and Factor VII act in phase I or phase II of coagulation. This has unfortunately resulted in confusion. A part of the confusion results from the numerous names given to similar factors concerned with coagulation (Table 1). Attempts are currently underway to standardize the coagulation nomenclature.

The time occupied by the thromboplastin-forming reactions accounts for most of the time needed for blood to clot, and it is occurrence of faults in this system which accounts for most of the hemorrhagic states due to defective coagulation. It is important to remember that all reactions in the three phases occur at the same time once thromboplastin has been formed.

* Revised Edition-1962.

Table 1

TERMINOLOGY

Factor

AHG	- antihemophiliac globulin factor, factor VIII
PTC	- plasma thromboplastic component factor, Christmas factor, factor IX
PTA	- plasma thromboplastic antecedent factor
Factor V	- labile factor, accelerator factor, plasma Ac-globulin, proaccelerin
Factor VII	- stable factor, serum prothrombin conversion accelerator (SPCA), proconvertin, prothrombin accelerator
Hageman Factor	- glass promoting factor
Factor X	- Stuart Prower Factor

The whole process of coagulation is initiated as soon as thromboplastin becomes available. Thromboplastin is not a component of the blood, and it must be generated. Thromboplastin, which the British state is tissue or incomplete thromboplastin, is present in tissues and tissue juices so that when injury takes place, the thromboplastin in tissue immediately starts the coagulation process locally but it must be supplemented by generation of thromboplastin within the blood by the thrombocytes and plasma factors. Tissues that have a high content of thromboplastin are (1) brain, (2) lung, (3) placenta, and (4) decidua. Thromboplastin is generated in the blood from substances that exist in the blood. Of first importance are the thrombocytes. As they break up, they yield a substance which has been called thromboplastinogenase or platelet factor which then reacts with a group of blood globulins (plasma factors). These are four in number and consist of antihemophilia globulin (AHG), plasma thromboplastin component (PTC), plasma thromboplastin antecedent (PTA), and Hageman factor (glass promoting factor).

In the second phase of coagulation active thromboplastin, Factor V, Factor VII, prothrombin and calcium react to form a small amount of thrombin. This small amount of thrombin causes more thrombocytes to agglutinate and lyse with more thromboplastin formed. More important is that the thrombin accelerates the formation of more thrombin by assisting in converting the inactive forms of Factor V and Factor VII into more active forms. The calcium is necessary for the action of Factor VII.

In the third phase fibrinogen and thrombin react to form fibrin. This step probably involves the polymerization of fibrinogen to form fibrin.

The occurrence of abnormalities in the first phase accounts for most of the hemorrhagic states due to defective coagulation. If thrombocytes are deficient, we clinically have a thrombocytopenic purpura with an abnormal clot retraction, prolonged bleeding time, and a normal clotting time. If there

is a deficiency of one of the plasma factors, the clotting time is prolonged with a normal bleeding time and prothrombin time.

Abnormalities in the second phase, a deficiency of Factor V, Factor VII, or prothrombin, prolong both the clotting time and prothrombin time, leaving a normal bleeding time.

Figure 1

Modern Theory of Coagulation

Phase One - Thromboplastin Generation (2-5 minutes)

(a) Thrombocytes + Plasma Factors (AHG, PTA, PTC, Hageman) →

Thromboplastin

(b) Tissue injury → tissue thromboplastin

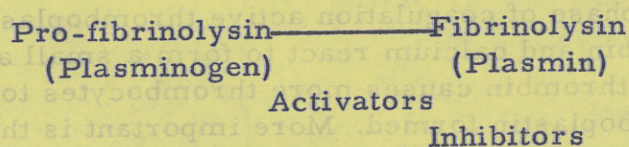
Phase Two - Thrombin Formation (Prothrombin Conversion) (10-15 seconds)

Thromboplastin + Prothrombin + Factor V + Factor VII + (Factor X?) →

Phase Three - Fibrin Formation (10-15 seconds)

Thrombin + Fibrinogen → Fibrin

The abnormality of the third phase is fibrinogen deficiency. Deficiency of fibrinogen is one of the rarest types of coagulation defect and is found in three sets of circumstances. Congenital inability to manufacture fibrinogen in sufficient amounts is the rarest of all the types. Second are those circumstances complicating labor, and almost all of these are cases of abruptio placenta. Third are those circumstances arising as a complication of major surgery, particularly thoracic or retroperitoneal surgery, which may be ascribed to the lysis of fibrinogen by a fibrinolytic system, presently still the subject of investigation. The fibrinolytic system is believed to be responsible for keeping the body's blood vessels free of fibrin deposits. The deposits may spontaneously form as a result of trauma or other less well understood events, e.g. phlebothrombosis. This system may be simply depicted as follows:



Under normal circumstances the active enzyme, fibrinolysin, exists in minute amounts in the blood. Under poorly understood circumstances "activators" may be released in large quantity to convert pro-fibrinolysin to fibrinolysin. If fibrinolysis occurs as a sequel, plasma coagulation factors, especially fibrinogen, are affected.

Fibrinolytic activity is apparently decreased following large doses of ionizing radiation. This situation is currently under study.

All laboratory techniques used to detect defects of the clotting mechanisms are based on observations on fibrin formation and the certainty of information obtained decreases with separation from this stage. Table 2 contains biochemical characteristics which aid in differentiation of the various clotting factors.

Table II

BIOCHEMICAL CHARACTERISTICS WHICH FACILITATE DIFFERENTIATION BETWEEN THE VARIOUS CLOTTING FACTORS

	AHG	PTC	PTA	Prothrombin	Factor VII	Factor V	Fibrinogen
Type protein (globulin)	+	+	+	+	+	+	-
Presence in serum	-	+	+	-	+	-	-
Utilization during clotting	+	-	+	+	-	+	+
Presence in stored plasma	-	+	+	+	+	-	+
Adsorption from oxalated plasma by BaSO ₄ , Al (OH) ₃	-	+	-	+	+	-	-
Adsorption from serum by BaSO ₄	-	-	+	-	+	-	-

Routine Laboratory Tests Which Detect Defects of the Clotting Mechanism

- | | |
|--|--------------------------------|
| 1. Whole blood coagulation time | 5. Clot retraction |
| 2. Plasma clotting time (recalcification time) | 6. Prothrombin consumption |
| 3. Bleeding time | 7. One stage prothrombin time |
| 4. Thrombocyte count | 8. Whole blood clot lysis time |
| | 9. Euglobulin lysis time |

Coagulation Time

Coagulation time is prolonged in hemophilia, PTC deficiency (Christmas disease), PTA deficiency, circulating anticoagulant, Factor V deficiency (parahemophilia, Owen's disease), Factor VII deficiency and fibrinogenopenia. Hypoprothrombinemia can also cause a prolonged coagulation time, but it is not

significant clinically as it is seen only when prothrombin is severely depressed to 5 per cent or less.

There are several methods for obtaining the coagulation time, three of which are described: Some methods are more simple than others, and while less accurate are still sufficient for clinical purposes when the only objective is to note the presence or absence of an abnormal clotting mechanism.

Plasma Clotting Time

(Recalcification Time)

This is a nonspecific type of test, similar to the whole blood coagulation time, in which the coagulation time of plasma is measured. Its greatest value is in the diagnosis of hemophilia. It is prolonged in hemophilia, afibrinogenemia, circulating anticoagulant, deficiencies of PTC, PTA, Factor V, Factor VII, and prothrombin. It is also prolonged in thrombocytopenias in contradistinction to the coagulation of whole blood which is normal.

Bleeding Time

The bleeding time is the time required for a small cut to cease bleeding. The role of the thrombocytes is so vital that a prolonged bleeding time may result if the thrombocytes are greatly reduced.

Thrombocytes (Platelets)

The chief function of the blood thrombocytes appears to be their control of the process of coagulation. Thrombocytes are essential for the formation of thromboplastin of the plasma, and they bring about retraction of the clot. They are important in protecting the walls of blood vessels when the endothelium becomes injured, since they adhere to the injured surfaces. They collect around cuts, traumatized surfaces and foreign bodies. When a blood vessel wall is injured or perforated the thrombocytes immediately accumulate in the area of injury. Adhering to one another, and to the edges of the injured areas they seal over the involved vessel wall. At the same time, an intensely active vasoconstrictor substance (serotonin) from the thrombocytes is released which acts on the injured vessel so as to maintain its initial contraction. It also causes contraction of other vessels in the vicinity. Serotonin acts only on vessels with muscular walls and not on the capillaries.

The number of thrombocytes in the human blood is difficult to determine because of a tendency to disintegrate, and because they adhere to foreign bodies and to one another. Most methods of counting have normal ranges from 140,000 to 700,000 per cu mm. If a patient's thrombocytes are reduced below 60,000 per cu mm, a hemorrhagic tendency usually becomes clinically evident.

Thrombocytes are irregular in size and shape, average 2-4 microns in diameter, contain fine azurophil granules, and stain pale lilac with Wright's stain. The normal life of a thrombocyte is about 5-7 days.

Thrombocyte counts are usually increased in tuberculosis, secondary anemia, and chronic granulocytic leukemia. Increased thrombocytes are seldom of clinical significance of themselves.

Reduction in thrombocytes (thrombocytopenia) is found accompanying infectious disease, pernicious anemia, lesions involving the bone marrow, the acute leukemias, and in acquired (secondary) and idiopathic thrombocytopenias. An important differential diagnostic point in thrombocytopenia and hemophilia is a normal thrombocyte count in the latter. Removal of the spleen in certain thrombocytopenic states is followed by a rise in thrombocytes which results in clinical improvement.

It has been recently shown that thrombocytes have agglutinogens. The plasma normally contains no agglutinins to platelet agglutinogens until sensitization has occurred. This may be one reason why after a thrombocyte transfusion there sometimes is no rise in the circulating thrombocyte count. An even more important factor is the physical state of the platelets infused. If they are grossly clumped when infused, they quickly disappear from the circulation.

Two syndromes in the past have been attributed to functional abnormalities of the thrombocytes; von Willebrand's disease and thrombasthenia. It is now accepted that in von Willebrand's disease the thrombocytes are normal and that it is due to an abnormality of the capillaries. (To be continued)

* * * * *



MISCELLANY

Training in Nuclear, Biological and Chemical Warfare Defense

Listed below are the convening dates for courses in Nuclear, Biological and Chemical Warfare Defense to be conducted at the U. S. Naval Schools Command, Treasure Island, San Francisco, California.

NBC Warfare Defense Ashore (6 weeks course)

21 Sept 1964 5 Apr 1965

NBC Warfare Defense Afloat (5 weeks course)

29 June 1964	8 Feb 1965
3 Aug 1964	15 Mar 1965
8 Sept 1964	19 Apr 1965
12 Oct 1964	24 May 1965
16 Nov 1964	28 Jun 1965

Although these courses are primarily designed for Line officers, they are considered to be valuable for Junior medical officers. The Bureau will be pleased to consider requests from medical officers who can be spared from their duties for the periods indicated. It will not be feasible to provide reliefs. Travel and per diem will be provided for a limited number depending upon the availability of funds. —Medical Corps Branch, Professional Division, BuMed

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Peace Corps Physical Examinations

BUMED has been advised by the Medical Program Division, Peace Corps, that: "A recent survey revealed that 23 per cent of the medical examinations performed by the Department of the Navy medical examining facilities were incomplete. The most common discrepancies noted were (1) failure of the examining physician to elaborate on positive items checked "YES" on the report of medical history, (2) abnormalities found on clinical evaluation were unexplained, and (3) results of laboratory tests were not recorded." Medical examiners are requested to make every effort to minimize the discrepancies noted. —Physical Qualifications and Medical Records Division, BUMED

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HISTORICAL FUND
of the
NAVY MEDICAL DEPARTMENT

A committee has been formed with representation from the Medical Corps, Dental Corps, Medical Service Corps, Nurse Corps, and the Hospital Corps for the purpose of creating a fund to be used for the collection and maintenance of items of historical interest to the Medical Department. Such items will include, but will not be limited to, portraits, memorials, etc., designed to perpetuate the memory of distinguished members of the Navy Medical Department. These memorials will be displayed in the Bureau of Medicine and Surgery and at the National Naval Medical Center. Medical Department officers, active and inactive, are invited to make small contributions to the fund. It is emphasized that all donations must be on a strictly voluntary basis. Funds received will be deposited in a Washington, D. C. bank to the credit of the

Navy Medical Department Historical Fund, and will be expended only as approved by the Committee or its successor and for the objectives stated.

It is anticipated that an historical committee will be organized at each of our medical activities. If you desire to contribute, please do so through your local historical committee or send your check direct, payable to Navy Medical Department Historical Fund, and mail to:

Treasurer, N. M. D. Historical Fund
Bureau of Medicine and Surgery (Code 14)
Department of the Navy
Washington, D. C. 20390

Committee

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* * * * *

15th Annual Armed Forces Day
to be Observed

The 15th Annual Armed Forces Day will be observed on 16 May 1964. Local observances throughout the United States and overseas will be scheduled during the period 9-17 May to permit greater public and military participation.

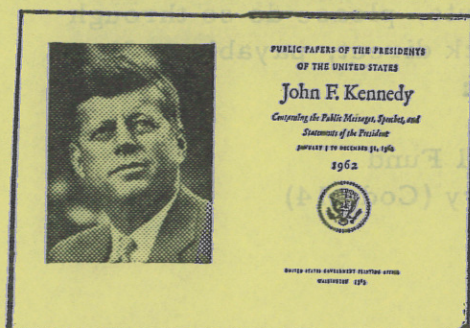
"Open House" events will be the principal feature of Armed Forces Day at all military posts, camps, stations, bases and defense facilities. Exhibits, exercises, parades, maneuvers, and demonstrations will present to the people of the world the occasion to see first-hand the strongest U.S. peacetime military organization in history.

Armed Forces Day symbolizes the common goals of the military services and demonstrates the close working relationship of the Navy, Army, Air Force, Marine Corps, Coast Guard, the Reserve Forces and the National Guard, and provides the American public the opportunity to view and inspect the preparedness of their Armed Forces. By Presidential Proclamation, the third Saturday in May has been made the permanent annual date for Armed Forces Day. POWER FOR PEACE, the Armed Forces Day slogan for the past 11 years, will again be used. —NAVNEWS, Washington, D. C., 1 April 1964.

* * * * *

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—From: "Federal Register," the National Archives of the United States,
29(70): 9 April 1964.

* * * * *

NEW MANUAL BRINGS NAVAL LEADERSHIP PROGRAM UP TO DATE

The United States Navy Manual for Leadership Support, NAVPERS 15934A, came off the presses on 1 April and is now being distributed to all ships and stations. It replaces and builds upon the United States Naval Leadership Manual, NAVPERS 15934. The first Leadership Manual was listed by the Freedom's Foundation at Valley Forge as one of the key reasons for giving the James Madison Award to the Bureau of Naval Personnel in 1962.

Like the old Leadership Manual, the new NAVPERS 15934A provides information on such topics as "Leadership, Why and How"; "Balanced Efforts

in Command Leadership"; "Five Steps Toward Effective Naval Leadership"; "Checklists for Personal Leadership"; "Passing the Word"; "Standard Discussion Outlines"; "How to Use Leadership Training Films"; and "The U. S. Code of Conduct. " The "Indicia of Naval Leadership" is also included; however, all these sections have been extensively revised and updated. New bibliographies of publications, films, and posters reflect the modern emphasis on general military training subjects as well as the references on leadership, personnel administration and management. These new bibliographies take the place of the discontinued, Information ("I") section of the Information and Education (I&E) Catalog, NAVPERS 15801. The discussion outlines have been updated, and new ones on such subjects as counterinsurgency and communist entrapment have been added.

For convenience in using it under a variety of conditions, the Manual is punched for use in loose-leaf binders and the reference sections are printed on blue paper. The initial distribution to Naval units is in sufficient quantity to provide internal dissemination. Additional copies may be obtained by ordering them through the Navy supply system. The Manual is available also from the Superintendent of Documents, Washington, D. C., at \$1.50 per copy.

ADM David L. McDonald, Chief of Naval Operations, in his foreword states: "I urge all persons in authority in the Naval service to practice the fundamental precepts outlined in this manual. "The Manual is, he writes, "a useful guide for all hands to train themselves and their shipmates to perform their duties with the skill and reliability of professional Navy men."

NOTE: There is no occupation where leadership principles, actively practiced, will yield more dividends than in the art and science of medicine and its paramedical specialties. It is a cardinal duty of MC, DC, MSC and NC officers, as also Hospital Corps CPOs, Petty Officers and sub-jacent ratings to brush up on this updated NAVPERS 15934A.

—Editor

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From the Note Book

Oil Slick Pollution of U. S. Harbors and Associated Waters. In its function as scientific and technical advisor to agencies of the U. S. Department of Defense, the Prevention of Deterioration Center (PDC), on 18 March 1964, assembled a conference dealing with the problem of oil slick pollution of harbors and associated waters.

The conference—held at the National Academy of Sciences, 2101 Constitution Avenue, N. W., Washington, D. C.—proceeded from an introduction and description of the problem, economic, health and other considerations, the effectiveness and shortcomings of present control methods, to pertinent conclusions and recommendations. Resources considered for further research and development relating to oil slick pollution clean-up processes involve:

bioengineering; physical, chemical and engineering procedures; established groups with a known interest in the problem; and information centers, literature and bibliographic services.

Because of the work of deterioration prevention encompasses chemistry, physics and biology, an important element of all PDC activities is the maintenance of scientific liaison between the various government laboratories, industrial organizations, private research institutes, universities and scientific societies. The list of attendees invited to this conference included representatives of the Army, Navy, and Coast Guard, the U.S. Public Health Service, Bureau of Mines, Fish and Wildlife Service, the National Academy of Sciences-National Research Council, the California Institute of Technology, the American Petroleum Institute, and private industry. —From: PDC Newsletter, PDC Division of Chemistry and Chemical Technology—National Academy of Sciences, Nat Res Council VII(3): 3, April 1964.

Navy Announces Uniform Changes. (Washington, NAVNEWS). The Navy has announced a number of changes to the "U.S. Navy Uniform Regulations, 1959." The changes, which will affect all officers and chief petty officers, are primarily aimed at establishing uniformity and at reducing portions of the uniform which have fallen into disuse. The Honorable Paul B. Fay, Under Secretary of the Navy, approved the suggestions of the Navy Uniform Board on 7 February and they will become effective at various dates consistent with present inventories and the time required to make the change.

One change concerns the dress uniform. In the past, only officers of the rank of commander and above were required to have the dinner dress blue jacket and the evening dress white jacket uniforms. The evening dress blue (tails) uniform was an optional item for all officers. The change in regulations has made the two jacket uniforms mandatory for all officers in the rank of lieutenant and above, effective 1 January 1965. The evening dress blue (tails) uniform is now required only for those officers assigned duties where state/protocol demands such dress. This change was made because of the excessive number of uniforms which were authorized for formal wear. In the future, lieutenants junior grade and below who do not voluntarily possess the formal jacket uniforms will wear the dress blue uniform. On formal occasions, however, miniature medals will be worn in place of ribbons and white gloves will be worn in place of grey gloves.

A second change will require that all officers on active duty (commissioned warrant officers and senior with the exception of chaplains) possess a sword. Previous to this change, only USN officers were required to have this item. This means that all officers upon commissioning and orders to active duty will be required to have a ceremonial sword as part of the uniform. Reserve officers on active duty who do not have swords will be required to purchase them prior to 1 January 1965.

Certain other portions of the uniform will be curtailed or discontinued. Uniform Regulations presently authorize the optional wearing of black or brown

"Wellington Boots" with the service dress blue, service dress khaki and working uniforms. In the future, the "Wellington Boot" will be authorized for wear only with the working uniforms. It was felt that the boot could cause an unmilitary appearance when worn with the dress uniform. The khaki raincoat with its double breasted design, belt, and large collar, is somewhat dated. Due to the wide acceptance of the new lightweight blue raincoat which can be worn with any uniform, the khaki coat will be discontinued as of 1 January 1966.

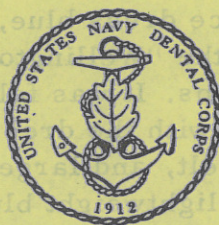
All stocks of rating badges and service stripes now procured via the supply system have embroidered chevrons on a background material to match the "issue type" uniforms. Rating badges and service stripes for tailor made uniforms of fabric other than issue types (primarily chief petty officer uniforms) must be procured especially for a particular uniform material and are hand sewn on the background fabric. Machine embroidering of these special rating badges and service stripes on hard finish materials such as serge and gabardine has been unsatisfactory, causing excessive fraying and deterioration of the thread. Use of felt chevrons and service stripes would help alleviate this problem. Inasmuch as felt chevrons offer almost the identical appearance as embroidered chevrons, and in the interest of economy, simplicity and durability, the new change authorized the optional use of felt chevrons for commercially procured rating badges and service stripes.

A final addition to the uniform regulations will authorize a breast insignia for those officers of the Supply Corps who are designated "Qualified in Submarines." The design is identical to the submarine engineering and submarine medical insignia except that the gold Supply Corps oak leaf shall be centered between the dolphins.

Ophthalmic Pathology Material Needed. The Registry of Ophthalmic Pathology, while generally believed to be the world's largest collection of ophthalmic pathology material, is nevertheless, or rather limited value since it consists almost exclusively of surgical specimens. The AFIP is most anxious to obtain more ophthalmic specimens from the autopsy table, especially eyes from many of the rather common diseases that affect the eyes, such as benign and malignant hypertension, generalized arteriolar sclerosis, atherosclerosis of the great vessels of the neck, diabetes mellitus, renal diseases of all types, and also from the less common diseases which frequently affect the eyes such as lupus erythematosus, periarteritis nodosa, bacterial endocarditis, septicemic conditions of all types, etc. AFIP is also interested in obtaining eyes post-mortem from any case, regardless of the nature of the disease process, in which the patient experienced any visual complaints or in which ophthalmoscopic examination in life revealed evidence of any intraocular pathology.

Eye specimens obtained postmortem should be fixed in 10% neutral formalin (approximately 500 cc) without prior opening of the eye. It is preferred to have the eyes shipped intact along with a copy of the autopsy protocol. —From Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D.C.

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DENTAL**SECTION****Dental Diseases Burden
National Economy***

By Dr. George E. Mitchell, Chief Health Programs Branch, Division
of Dental Public Health and Resources, PHS DHEW.

Our nation's dental health problems—formidable by any standard—are created and compounded because neither prevention nor treatment is being applied to the fullest possible extent.

Dental diseases are a serious drag on the economy, largely because of neglect. Dental decay attacks about 97 percent of the population and is particularly serious among young people. Periodontal diseases, not uncommon among children, occur in about half of the adult population by middle age and cause 80 percent of tooth loss for those over 45. About half of all school-age children have malocclusion serious enough to warrant treatment, and one of five has a serious orthodontic defect. Loss of teeth and failure to get dentures is another part of the dental problem. More than 24 million people in the US today have no remaining natural teeth and only one-third of this number have dentures.

Most people do not consider dental conditions serious enough to require immediate attention, and this is the single greatest reason for the public's neglect. Income and educational levels have an important bearing on the use of dental services, and, of these two determining factors, income seems to be more important than education. A survey showed that only one-fourth of families with incomes of less than \$2,000 a year had ever been to a dentist, while 90 percent of those making \$7,000 or more had visited a dentist at least once. When income was held constant, utilization of services varied by educational level.

Dental prepayment plans are growing rapidly and are proving an effective mechanism for extending dental services to more people. Once the economic barrier to dental care is removed, utilization of services increases and the problem of neglect is reduced. Labor unions in particular have realized

*This article and the two succeeding articles are from "Summaries of Selected Papers," 91st Annual Meeting of the American Public Health Association and Related Organizations, Kansas City, Mo., Nov. 11-15, 1963—as published in Public Health Reports PHS DHEW 79(3): 243-244, March 1964.

the importance of providing dental insurance for their members. In fact, dental programs for children of members of two West Coast unions have shown that dental prepayment, together with an effective health educational program, produces high utilization of dental services and, along with it, good dental health.

* * * * *

Fluorosis Is Reduced By Defluoridation

By Dr. Herschel S. Horowitz, Chief, Research and Development Section, Disease Control Branch, Division of Dental Public Health Resources, PHS DHEW.

Objectionable dental fluorosis was drastically reduced as a result of partial defluoridation of the natural water supply in Bartlett, Tex. The results of an 11-year study present the first clinical evidence of a practical method for chemically removing excessive fluorides from natural waters. Following installation of a defluoridation plant in Bartlett, the study began with a baseline survey in 1954 to determine the extent of dental fluorosis among the continuous resident children in Bartlett, and a followup examination was made in 1963.

While 94 percent of children aged 10 and under examined in 1954 had positive signs of fluorosis, by 1963 only 21 percent exhibited mottling and nearly all of these were in the milder categories. No child aged 10 or under was seen in 1963 with severely mottled teeth and only two showed moderate fluorosis.

Children 10 years of age or younger in 1963 had a mean fluorosis score of 0.42 compared with the baseline figure of 2.36 for this age group. Children 11 years and over, whose period of tooth calcification overlapped the change in fluoride content of the water supply, had a smaller reduction in average scores which were 2.71 in 1954 and 2.20 in 1963.

The Bartlett experience is especially important because it demonstrates what can be accomplished in other communities served by water sources that contain fluoride in excess of the optimum range. Objections to defluoridation on the basis of excessive costs and doubtful benefits are no longer tenable. Partial defluoridation has been recommended for the 800 or more communities now being served by public water supplies containing excessive fluorides.

* * * * *

Dental Care Program Tried for Handicapped *

An experimental program of dental care, initiated in 1961 by the Idaho Department of Health through a contract with the Public Health Service, is yielding information that may determine the type of community program that could best

be organized to meet the needs of handicapped children. Children under 21 with physical or mental impairment severe enough to complicate the provision of dental care were considered eligible for treatment in this program.

Prior to its start, one or more dentists from each of the State's six major population centers were selected to attend a 5-day course in dentistry for the handicapped. Portable air turbines, purchased and assigned to each of these centers, were available for use either in the home or hospital. Many children were treated in the offices of their family dentists who had received special training and were prepared to operate under a general anesthetic if necessary. Payment for care was determined on the basis of the fee schedule used by the department's crippled children's service.

Some 253 children, ranging in age from 5 to 17 years, were treated during the first 2 years of this program. The largest group (143) had cerebral palsy (including 12 who were also severely retarded), and 91 had a primary diagnosis of mental retardation.

Costs of treatment, including dental care, all medical and hospital costs (where indicated) for pediatric examinations, anesthesia, and hospitalization, averaged \$85.25 per child. About 10 percent of the children represented total costs of less than \$25 each, while for an almost equal number costs exceeded \$200. In a series of recall examinations, however, the costs of providing care dropped precipitously with the average total cost ranging from \$15 to \$18, although the charges for individual children varied from \$4.50 to about \$100.

Additional data will be available as the study progresses but the experience so far indicates that dental care and services could be provided for handicapped children in their own communities and that once the initial treatment needs had been met maintenance care need not be overwhelmingly expensive.

If a treatment program like Idaho's were to be initiated on an incremental basis, it would be possible for most agencies to provide dental care for handicapped children for only a fraction of their total rehabilitation budgets.

*Dr. Wesley O. Young, Associate Professor and Chairman, Dept. of Community Dentistry, College of Dentistry, University of Kentucky.

A Cinematic Study Of Centric and Eccentric Occlusions

By Lawrence A. Weinberg DDS MS. New York University, College of Dentistry. J Pros Dent 14(2): 290-293, March-April 1964.

One hundred dentulous subjects were recorded cinematically in order to investigate the relationship between the occlusal pattern, centric relation, centric occlusion, and temporomandibular joint dysfunction. The majority of the subjects (81 percent) exhibited lateral working side cuspal contact; only 19 percent had a canine-protected occlusion.

A 2 mm discrepancy between centric relation and centric occlusion was found in only one subject of the working side contact group, whereas more than half of the canine-protected group had this degree of "hit and slide." This evidence suggests the possibility of an association between a canine protected occlusion and large discrepancies between centric relation and centric occlusion.

Three subjects of the four with temporomandibular joint dysfunctions were found in the canine-protected occlusion group. However, 2 mm discrepancies between centric relation and centric occlusion in each subject with temporomandibular joint disturbances lead to the association of centric occlusal disharmony with joint pathology. However, it would be premature to relate the canine-protected occlusion directly to temporomandibular joint dysfunction.

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Personnel and Professional Notes

Policy on Stannous Fluoride. The Inspector General, Dental, makes each activity's Preventive Dentistry program a routine factor in each inspection. Continuing inquiries concerning policy on SnF_2 caries prevention treatments in naval personnel have indicated a high level of professional interest, which the Chief of the Dental Division, Bureau of Medicine and Surgery, finds most gratifying.

The current status of the Navy's research on this subject was described in the U. S. Navy Medical News Letter 42(7): 22-24, 1963. A source for open purchase of a Stannous Fluoride Prophylaxis Kit was published in the U. S. Navy Medical News Letter 42(9): 25-26, 1963; and the supplier provides directions for use in each kit. The differences between the kit's instructions and the technic used at NMRL New London are insignificant.

The field of caries prevention is changing rapidly, and all dental officers are enjoined to maintain cognizance of the advances reported in the scientific literature. The NMRL New London data on one and two-year cariostasis will be published in the fall of 1964 and 1965. One problem concerned with this study is that the procedure takes about 45 minutes per patient; and it would be difficult to provide this annual procedure for all naval personnel. BuMed supported exploratory studies on less time-consuming technics are in process.

In the interim, until more data are available, all naval dental activities are urged to provide this annual treatment to as many personnel as possible; certainly no routine prophylaxis should be performed without inclusion of SnF_2 . In this practice, all naval dental personnel shall be on the alert for NMRL New London test subjects, whose dental records are clearly marked. The SnF_2 treatment schedule for these men shall not be altered.

Navy Dentist Elected Vice President. CAPT Harry H. Fridley DC USN, was elected to serve as First Vice President of the American Academy of Crown and Bridge Prosthodontics. CAPT Fridley is Executive Officer of the U. S. Naval Dental Clinic, Washington, D. C.

New Dental Reserve CompaniesEstablished or Activated

U.S. Naval Reserve Dental Company 9-36. Established 1 June 1963. University of Illinois. Commanding Officer: LCDR William L. McDaniel DC USNR.

U.S. Naval Reserve Dental Company 9-37. Established 1 July 1963. Milwaukee, Wisconsin. Commanding Officer: (Unassigned)

U.S. Naval Reserve Dental Company 9-38. Activated 1 December 1963. Washington University, St. Louis, Mo. 42 drill unit (Ensign Company). Commanding Officer: LT Robert W. Koch DC USNR.

U.S. Naval Reserve Dental Company 9-39. Activated 1 January 1964. University of Missouri at Kansas City, Mo. 42 drill unit (Ensign Company). Commanding Officer: LT Wayne L. Harvey DC USNR.

U.S. Naval Reserve Dental Company 9-40. Activated 1 January 1964. Northwestern University, Chicago, Illinois. 42 drill unit (Ensign Company). Commanding Officer: LCDR Edward S. Laskowski DC USNR.

U.S. Naval Reserve Dental Company 9-41. Requested establishment 1 January 1964. Creighton University, Omaha, Nebraska. Proposed Ensign Company. Commanding Officer: LT John F. Marley DC USNR.

Fellowship Conferred on CAPT Heck. At the 3rd Annual Convocation of the Academy of General Dentistry, held in February of this year, Fellowship in the Academy was conferred upon CAPT Charles M. Heck DC USN in recognition of his contribution to continuing dental education through development of the Extension Education Program of the Naval Dental Corps. CAPT Heck is currently Head, Extension Education Department, Naval Dental School, NNMC, Bethesda, Md.

USC Dentists Present Oral Surgery Program. Staff members of the University of Southern California School of Dentistry presented an oral surgery program for dental officers of the San Diego area on 4 March 1964. Doctors Charles Yoon, Bernard Byrd, and Robert Fogler presented demonstrations of the utilization of an "L" plate in the immobilization of subcondylar fractures, and the correction of mandibular micrognathia by vertical osteotomy of the rami. Two narrated films were also presented describing oral surgical techniques.

The program was hosted by CAPT B.H. Faubion, Director, and CAPT J.F. McKinney, Oral Surgeon, of the Dental Department, U.S. Naval Training Center, San Diego, California.

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OCCUPATIONAL MEDICINE

Beware of Oxygen Leaks

By O. H. Haier, Standard Oil Company, Ohio, Safety Review 21(3): 10, March, 1964.

A tragedy occurred from an unusual, and perhaps overlooked, cause involving the use of a cutting torch.

Three men were working on a scaffold inside a tank that had been properly prepared for hot work. An acetylene torch was being used. The oxygen and acetylene cylinders were located outside the tank, and the hoses were run through the manhole and up to the scaffold.

The torch was used to cut some metal, and then set on the scaffold while the men performed other mechanical work. The oxygen and acetylene were turned off at the torch valves. About 3 hours later one of the men picked up the torch to do some burning, turned on the acetylene, and struck a spark to ignite it. With this act, the clothing of all three men burst into flames. Two of them were fatally burned, the other received serious burns that hospitalized him for an extended period.

A leak in the oxygen hose, at or near the point where it connects to the torch, caused the tragedy. It could not be determined whether the hose was defective before the men started it, or whether it had been cut or damaged while lying on the scaffold platform. In any event, the leak created an oxygen-rich atmosphere in the area in which the men were working, permeating their clothing and increasing its combustibility. The adjacent torch flame literally exploded their clothing into flames.

Possible preventive measures to avoid a similar accident should include: (1) Before using acetylene burning equipment in an enclosed space, examine the hoses, connections, and fittings for signs of leakage. (2) When an acetylene torch is not to be used for an extended period, both acetylene and oxygen valves should be closed off at the cylinders. (3) Maintain continuous, positive ventilation in enclosed areas where men are working, and (4) Hoses from cylinders to an acetylene torch should be placed so they are protected from mechanical damage; and when a torch is set aside, place it in a safe position.

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Man, Medicine, and Work

USDHEW PHS, Division of Occupational Health, LENGEL WO 2-1080.

A new publication "Man, Medicine, and Work" has just been released by the Division of Occupational Health of the U. S. Public Health Service. This publication traces the growth and development of occupational medicine and was developed from an exhibit by Dr. Jean S. Felton of the University of California, and was published on the occasion of the Division's 50th year of service in furthering the health of workers.

Beginning with prehistoric man, "Man, Medicine, and Work" portrays man's efforts to control his environment and his battles against the sometimes mysterious, and always present, danger of occupational illness. Not until Bernardino Ramazzini, the father of occupational medicine, made his classic studies in the 17th century on the diseases of workers were any efforts made to protect people who worked. Ramazzini's advice was unheeded while the world underwent the economic and social upheaval of the industrial revolution. The wholesale poisonings, crippling and maiming of workers, inherent in the industrial environment of the time, however, created a social awareness of the problem, and the modern concept of occupational medicine was born. Today, workers can face their jobs with far greater assurance of health and well-being than ever before thought possible.

"Man, Medicine, and Work" may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, at \$.40 a copy. Single copies are available from the Public Inquiries Branch, Office of Information and Publications or from the Division of Occupational Health, U. S. Public Health Service, Washington, D. C. 20201.

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Fatal Addiction to Trichloroethylene

By W. R. L. James, Welsh National School of Medicine, Cardiff, Wales.

Brit J Indust Med 20:47, 1963. Abstracted from Journal of Occupational Medicine 6(3): 161-162, March 1964.

A 31 year old foreman in an electroplating plant died suddenly at work, some 17 hours after cleaning out sludge from a degreasing vat where trichloroethylene was heated. He had been at this plant for 9 years. Soon after employment he had been found unconscious in a vat containing wet sludge, and had recovered after 2 days' hospitalization. Several times in the intervening years he had been reprimanded for entering the vats in cleaning them, contrary to safety regulations. In fact, 6 months before his death he had been threatened with discharge if it should happen again. He had been noticed periodically leaning over a full vat, with no occupational reason for doing so.

In the year prior to his death his manager had noticed bouts of lethargy, slurred speech, and unsteadiness of feet. His wife reported that he had become unable to smell even ammonia, and that he sometimes vomited his food and was drowsy on days he cleaned out the vats. He was a teetotaler.

Autopsy showed recent small lung hemorrhages and midzonal fatty degeneration of the liver. The blood and digestive contents showed significant concentrations of trichloroethylene, and the urine, trichloroacetic acid. The findings suggested intermittent trichloroethylene intoxication, with acute massive intake some hours before death. The exact mechanism of death was not clear. Toxicity of breakdown products and ventricular fibrillation were suspect. A main point in compensation adjudication was contributory negligence on the part of the employee, who was considered addicted.

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Ventilation Objectives

L. Rispler, P Eng and C. R. Ross, P Eng, Occupational Health Division, Department of National Health and Welfare, Ottawa. Occupational Health Bulletin 19(1,2), 1964.

The term "ventilation" can mean air movements to and from a room, building or any defined space. These air movements are due to pressure differences created by mechanical fans and other equipment, or by natural air pressure and temperature differences. Beyond this general description, it is often difficult to know exactly what people have in mind when they speak of ventilation. As a result, many misunderstandings occur. These may lead to a series of misdirected complaints whenever a ventilation system is inadequate because of design, unrealistic cost-cutting, or neglected maintenance. At first, occupants begin to notice in a general way that conditions are not satisfactory. Mistakenly, they may criticize the air-handling system as if it were some type of standard item that basically is no good, or condemn the whole ventilation industry. They will generally blame the wrong condition as the source of trouble and devise "do-it-yourself" remedies without satisfactorily resolving the problem. The true shortcoming of such systems, however, can be predicted at an early stage if there is a common understanding of ventilation objectives.

Ventilation systems vary both in form and in capacity to fulfill basic needs. In addition to simply moving air they may also change some of its properties. For example, a system may heat, cool, humidify, de-humidify, filter, or deodorize the air passing through it. Ventilation can therefore mean anything from an open window to an elaborate air-handling system complete with fans, ductwork and other related equipment.

Like ventilation, the term air-conditioning leads to some confusion. By definition, an air-conditioning system is one that simultaneously controls most of the above air properties. But some people disregard this definition and consider that a space is air-conditioned even if the air unit is only capable of cooling.

To avoid misunderstandings, the purpose of a ventilation system should be clearly defined. One provides ventilation not simply for the sake of ventilation but to obtain certain desirable conditions. On this basis, the general definition is often divided into various categories, for example: comfort ventilation and industrial ventilation. Many of these, however, are not very distinctive classifications and result only in a general connotation. They have their value, but it is preferable to use more specific descriptions to stress the primary purpose of a ventilation system. Consideration of the following objectives will often help one to assess accurately the need for ventilation and the usefulness of any particular system.

Temperature Control. The principal factors in our thermal environment are the temperature, humidity and velocity of the air, and the temperature of surrounding walls, windows and other surfaces. For a given situation one factor may be a predominant cause for discomfort and should be recognized as such; alteration of the other factors may result in only limited improvement. In hot conditions, humidity can be of prime importance because it restricts the evaporation of sweat, a principal mechanism for body cooling. In more comfortable conditions the humidity level is usually unimportant, but effects of air velocity may be quite significant. The temperatures of surrounding surfaces are always important. Although this factor cannot be controlled by ventilation, appropriate measures can be instituted. For example, heat shields may be used to protect workers from extremely high surface temperatures.

In ordinary living and working spaces, a poor combination of wall temperatures and air temperature is often the true cause of complaints of "stiffness" and other discomforts, although they are generally blamed on "poor ventilation." Not realizing that wall temperatures are the basic cause of their discomfort, people will compensate for the chilling effect of cold walls and window areas by maintaining higher air temperatures. This, in turn, causes a sensation of dryness and stuffiness which the occupants might insist is caused by low humidity, lack of air movements, or a mysterious shortage of "fresh" air. One may label certain feelings as "stuffy," "close," "airy," "sticky," "dry," "drafty," "muggy," and "chilly." However, the sensing mechanisms of the human body are limited to this extent of interpretation; accurate assessment of the true cause of discomfort must usually be made by objective analysis of the thermal environment in relation to the rates of body heat exchange.

All of us provide heating and ventilation in buildings not to warm or cool our bodies, but to enable them to lose heat at about the same rate it is generated by our metabolism. This is the main purpose of ventilating for human comfort. Ventilation systems are not designed to maintain satisfactory oxygen and carbon-dioxide levels in the air of occupied spaces. Even in a crowded room, there will likely be sufficient air replacement to meet this need by natural leakage of air through walls, ceilings, floors, and cracks. But without special provisions to remove body heat and moisture losses, the resulting thermal conditions can become intolerable and may result in headache, fatigue, dizziness or nausea. The pleasant sensation experienced after leaving such a room is not due to magic qualities of "fresh" air but to the resulting cooling effect and reduced odor level.

Odor Control. Odor cannot be directly measured by instrumentation, and there is considerable variation in peoples' sense of smell. As a result, there are often wide differences of opinion concerning how much air treatment or dilution is necessary for satisfactory odor control.

Sometimes odor problems can be contained satisfactorily simply by controlling general air movements. The flow can be directed from areas with low odor levels toward more odorous spaces and exhausted directly to the outdoors; for example, from dining area to kitchen to outdoors, or from offices to washrooms to outdoors. Also, odors may be diluted with air, or substances may be added deliberately to the air to mask or counteract the objectionable odor. Odorless air for dilution may be obtained from outdoors or by recirculating inside air through equipment which actually removes odors by absorption or adsorption. When the local outdoor air is not sufficiently odor free, it will require treatment, and extra care must be taken to prevent infiltration of untreated outdoor air. Also, discharging polluted air outdoors can create an odor nuisance problem. Sometimes the natural atmospheric dilution rate is not sufficient to reduce the offensiveness of smells before they reach nearby buildings and occupied areas. It may be necessary to provide a high discharge stack, treat the exhaust air by one of the previously mentioned methods, or convert it to less odorous products by burning with or without catalysts.

Humidity Control. The control of humidity within specified limits is a requirement for some industrial and commercial processes, laboratories, storage rooms and other areas where it may affect product quality or operating characteristics. Humidity is also a factor in hot environments as it can seriously affect people subjected to heat stress.

Before humidity control is undertaken, it is important to ensure that building construction features are suitable for the intended conditions. Water vapor will pass through walls, floors, and ceilings so it is sometimes difficult, if not impossible, to maintain the desired humidity. Also, there may be a risk of condensation damage in cold weather even with relatively dry indoor air. To avoid this, it is imperative to lower indoor humidity levels as the outdoor temperature drops below the freezing point. For year round humidity control the installation of ventilation systems, vapor barriers, and perhaps the complete elimination of windows may be required.

Nuisance Dust Control. There are instances where the primary purpose of a ventilation system is to reduce particulate contamination. But nuisance dust filtration is often essentially a secondary requirement imposed in the course of fulfilling another objective. For example, it is sometimes advantageous to draw outdoor air into a system for odor or temperature control; then it becomes necessary to filter excessive dust out of the outdoor air used. If specially treated recirculated air is employed instead of outdoor air, pre-filters are usually required to keep the air treatment equipment clean for efficient operation.

In any case, nuisance dust control is important in most buildings to reduce soiling and contamination of walls, ceilings, products, merchandise,

equipment and furnishings. There is a broad range of atmospheric contamination and a wide variation in soiling properties of particulate matter. This makes it difficult to specify the degree of air cleaning desirable for a given situation. Usually considerable judgement is required in selecting the most appropriate type of air cleaning device.

Toxic Dust, Fume, Vapor, Gas Control. Satisfactory evaluation and control of airborne health hazards require a particular knowledge of health aspects as well as ventilation. Specialists in this phase of industrial health engineering should be consulted when there is a possibility of toxic contamination. A refined analysis of air flow rates and flow patterns is more essential for these problems than for most other ventilation design work.

There are some common misconceptions that may lead people into a false sense of security about their particular operations. It is a mistake to consider that respirable airborne contaminants are "heavier" or "lighter" than air. In the harmful range of particulate sizes and gaseous concentrations they mix by diffusion with air and, regardless of the density of the contaminant, the mixture quickly attains a density essentially the same as air. Contaminants such as lead dust, degreasing vapors, or engine exhaust fumes and gases all travel with air currents and are not subject to independent motion. Moreover, general ventilation of a whole space does not necessarily provide adequate protection for the occupants. This is because it is only a form of dilution ventilation and the contaminant concentration at any point in the space will depend on the distance from its source of generation and the mixing action of the air currents. Therefore, persons may breathe dangerously high concentrations at some locations even though other areas of the same space are relatively free of contamination. Generally, the best control method is a local exhaust system designed to capture contaminants before they escape into the general space and to carry them within ducts for proper disposal elsewhere.

Unfortunately, many ventilation systems in use are inefficient and not continuously effective because of airflow characteristics of exhaust hoods, extraneous air movements, or neglect to replace air exhausted from a room. Furthermore, general ventilation air quantities, local exhaust rates and methods of air distribution are often poorly chosen.

Flammable Vapor, Gas or Combustible Dust Control. Generally, flammable or combustible substances are also toxic, and ventilation requirements for control of the health hazard will take precedence. That is to say, a substance is usually undesirable for health reasons at lower concentrations than are necessary to create fires and explosions. Thus, when vapor, gas or dust concentrations are controlled for health reasons the fire and explosion hazard is automatically reduced. There are many locations not regularly occupied and some exceptions where the primary objective of ventilation is to control flammable and combustible materials.

Sometimes it is not clear whether a ventilation system is intended for diluting a continuous leak or for removing a single release of combustibles after a sudden spill or malfunction of equipment. The capabilities and limitations of a system should be clearly defined to avoid dangerous misunderstandings.

There are many ventilation objectives, each with its distinctive purposes and associated problems. However, the above generalities often provide a sufficient basis to query the intent of ventilation applications. An analysis of some situations may indicate that a ventilation system is merely churning air and is not properly designed to accomplish its true purpose. In others, one or more objectives may be partially satisfied, but only to a very limited extent. Consequently, the comfort and health of the occupants of such spaces is unnecessarily compromised. To prevent such shortcomings the specific functions of ventilation must always be borne in mind.

* * * * *

The Occupational Carbon Monoxide Hazard of Commercial Vehicle Drivers

Prof Warren A. Cook, School of Public Health, Univ of Michigan, Ann Arbor, Mich, Industrial Medicine & Surgery 33(3): 118-120, March 1964.

The occupational carbon monoxide hazard of commercial vehicle drivers under present traffic conditions has been determined and may be estimated for future conditions by analysis of data obtained in an extensive study conducted in the city of Detroit.

A number of investigations have shown excessive concentrations of carbon monoxide in motor vehicles, but in most cases the carbon monoxide may be assumed to have resulted from leaky manifolds or corroded exhaust pipes. In this article the carbon monoxide present in the ambient air over which the owner or operator of the commercial motor vehicle has no control is the condition under consideration, not the leaky exhaust system which can be avoided by proper maintenance.

CO-Hemoglobin Blood Saturation. The CO-hemoglobin saturation of the blood of the commercial motor vehicle driver operating within a large city will be greater than that of incidental drivers in those cases in which he remains within high traffic areas over most of the work day. The person driving only to and from work through city streets or on urban depressed highways will be subjected to traffic gases usually for less than one hour. During this time the blood will reach only about a third to a half of the equilibrium saturation. The atmospheric concentration would have to be over 500 parts per million during the hour in order for the CO-hemoglobin saturation to reach 20%, and 400 ppm to reach 15%. When the commercial vehicle driver is exposed to the ambient carbon monoxide concentration over the entire day, his blood would reach the equilibrium saturation. That is, a 20% CO-hemoglobin saturation would occur on a continued exposure to a concentration of 160 ppm, and a 15% saturation on exposure to 110 ppm.

Just what are the percent CO-hemoglobin saturations of drivers and others involved in motor vehicle accidents? Table I gives the results of blood analyses of 227 persons involved in traffic accidents in the Detroit area. With

a single exception, these showed less than 12% CO-hemoglobin saturation. The one blood sample with a value of 31.5% must have resulted from a leaky exhaust system within the vehicle since ambient carbon monoxide concentrations were not sufficient even to approach this high blood finding.

Table I

**Blood Analyses of Persons Injured
In Traffic Accidents**

Blood Saturation in Percent CO- Hemoglobin	Total Number of Analyses	Drivers	Pedes- trians	Passen- gers	Un- knowns
Less than 1.0	73	27	30	5	11
1.0 - 4.9	114	53	40	5	16
5.0 - 9.9	37	19	14	1	3
10.0 - 11.9	2	1			1
31.5	1				1
Totals	227	100	84	11	32

In addition to the blood samples of injured persons, a group of samples was collected at two hour intervals from two persons in a police car over an eight hour day. During this time the car was being driven about the high traffic areas of the city simulating commercial vehicle driving. The nine blood samples of one, a nonsmoker, ranged from 0.8 to 1.2% CO-hemoglobin; of the other, who smoked cigars most of the test period, from 3.1 to 3.9%. Carbon monoxide concentrations inside the car averaged 17 ppm, with a peak of 120 ppm when the car was stopped with the engine idling.

Actually, the CO-hemoglobin saturation necessary to cause increased accident susceptibility in present day driving stresses has not been determined. The most competent investigation so far published was that by Forbes, et al., at the Harvard School of Public Health as long ago as 1937. It was concluded that simulated driving test performances were unaffected at a CO-hemoglobin saturation level of 25% and were not disturbed until 30% was reached. This value appears high as compared with present day concepts. Certainly vision is affected at much lower levels. With lack of a current scientifically based value, it is necessary to hypothesize the probable threshold values of effect of carbon monoxide on motor vehicle driving ability. It would appear that this value would be no less than 15% and no more than 20% CO-hemoglobin saturation, depending, on criteria employed and the interpretation of the criteria.

Carbon Monoxide Concentrations. Carbon monoxide concentrations were obtained during more than a year at three locations in Detroit by means of continuous recording nondispersing infrared spectrophotometers. These locations are in downtown Detroit, a neighborhood shopping intersection, and a depressed highway within the city.

As may be expected, peaks occurred in the morning and afternoon rush hours at each of these locations. Many more vehicles operate per hour in the depressed highway, and it had been thought that carbon monoxide concentrations would be significantly higher in this location. The greater air turbulence caused by faster moving traffic is undoubtedly the reason for concentrations being of the same order of magnitude as those at the other two locations.

The commercial vehicle driver operating in the areas of the city of which the three sampling locations are representative would in most cases be subjected to a nine hour exposure to ambient CO concentrations over the hours of 7:30 a.m. to 5:30 p.m., allowing for a half hour drive between home and workplace. Depending on the area of the city in which the commercial driver was operating, his occupational exposure would range from 12 to 25 ppm during the first hour and a half, it would then fall to 10 to 18 ppm during most of the day, and rise to 17 to 32 ppm over the last hour and a half. The levels cited were recorded during the fall and early winter months when temperature inversions and low wind velocities are present to a greater extent than at other times of the year.

Since it requires 160 ppm to produce a blood saturation of 20% CO-hemoglobin saturation and 110 ppm to produce 15% even at equilibrium, it is obvious that the current traffic load in Detroit does not produce enough carbon monoxide to constitute a hazard. The important question is, how much can the traffic load increase before the carbon monoxide reaches levels where it does introduce a hazard to commercial vehicle drivers?

Increase in CO with Traffic. The rate of increase in carbon monoxide concentrations with increase in rate of traffic flow was found to depend greatly on the nature of the location. Under a given set of meteorological conditions, the carbon monoxide concentration increased 7.2 ppm at the downtown Detroit location for every 1,000 increment in the traffic density in terms of vehicles per hour. At the neighborhood shopping area, the value was 9.9 ppm; and at the depressed highway location, 1.9 ppm for every 1,000 increment in traffic density.

Since the slopes of the graphs of CO concentrations vs. traffic density may change as the density increases beyond that observed, extrapolations should be made with caution. Using the mathematical model that seemed to have the best fit with observed data, a traffic load of 15,000 vehicles per hour on the depressed highway would result in a CO concentration of 49 ppm when there was no temperature inversion and the wind speed was 25 knots. However, during a temperature inversion with wind speed as low as one knot, the mathematical model predicts that an hourly traffic rate of 15,000 vehicles will produce a concentration of 205 ppm—obviously a hazardous level.

Present traffic conditions in the City of Detroit produce insufficient carbon monoxide to constitute a hazard, either to health or to driving ability. Statistical treatment of the findings indicate, however, that a combination of increased traffic load and meteorological conditions favoring accumulation of exhaust gas may result in excessive concentrations of carbon monoxide.

Occupational Health in Latin America

From "Facts on Health Problems," Pan American Health Organization, WHO, July 1961.

Industrialization brings with it such problems as air pollution, stream and lake pollution, adequate housing, occupational health, and municipal planning. Attention must be directed to each of these fields by governments as industrial or urban development is planned. At present the activity directed to prevention of water pollution and air pollution problems in most Latin American countries is limited. Little attention has been generally given to the public health aspects of housing and to municipal planning. Industrial health problems are just now beginning to receive attention.

Serious obstacles in the development of the rich resources of Latin American countries are the many diseases which debilitate the worker and restrict his production. In addition to the gastro-intestinal, communicable and respiratory diseases, work-related diseases, such as silicosis, poisoning from toxic metals, gases, vapors and fumes are common. Occupational health practices for the control of accidents and occupational diseases are unknown or only just beginning to be introduced.

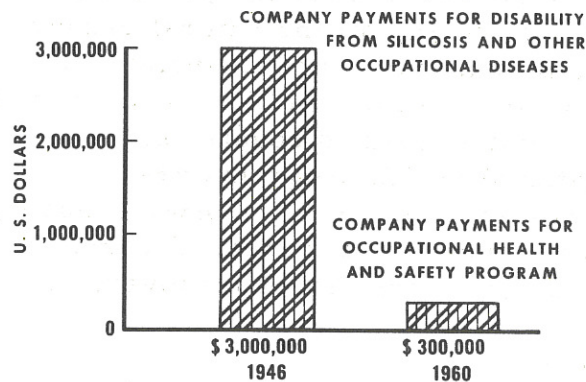
Studies of occupational health problems in 13 Latin American republics indicate the high incidence of sickness and the resultant excessive costs which industry pays out in compensation. These costs from disability among the gainfully employed on the average amount to approximately 15% of national incomes. This is an unnecessarily great economic burden for any country to carry. If occupational health programs closely integrated with general health activities could eliminate even 10% of these losses, much would be accomplished from the human and social viewpoint as well as from economic considerations. Experience has shown that this is a minimum expectation for economic returns.

Silicosis, a disease resulting from inhalation of silica dusts in certain mining, quarrying and sandblasting operations, is characterized by changes in the lungs with increased susceptibility to tuberculosis. Silicosis is incurable with the seriousness and the disability dependent on the amount and type of exposure. The major impact of silicosis on society is economic which is reflected in high compensation costs. Methods of prevention are now known.

Examples of the value of an occupational health program of prevention and control are cited to illustrate the financial implications.

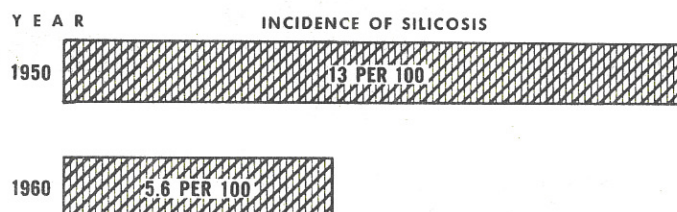
A large copper mine in Chile (1), prior to the establishment of a modern industrial hygiene and safety program in 1946, used to spend as much as \$3,000,000 per year in compensation for silicosis and other occupational diseases. After the inauguration of its preventive and control program, the expenditure of the entire occupational health and safety program was reduced to around \$300,000 per year in 1960.

**REDUCTION OF ECONOMIC BURDEN OF OCCUPATIONAL DISABILITY
IN A COPPER MINE BY HEALTH AND SAFETY PROGRAM**



In the United States (2) it was estimated that 10 million dollars were paid per year for compensation costs of silicosis cases outstanding since 1950 while, in contrast, the budgets of official industrial agencies amount to less than 3 million dollars annually. These agencies are responsible for the control and prevention not only of silicosis but also of all other occupational diseases.

**REDUCTION IN INCIDENCE OF SILICOSIS BY OCCUPATIONAL
HEALTH PROGRAM IN PERU**



In Peru an important source of income is from metal mines. In 1949 a co-operative program was initiated in which the incidence of silicosis was found to be 13 per 100 in 1950.

The Institute of Occupational Health of the Ministry of Public Health, supported by funds from the metal mining industry, carried on preventive and control programs with introduction of measures such as exhaust ventilation, suppression of dust by wet methods, respiratory protection and medical control which prevent silicosis.

In 1960 the incidence was reduced to 5.6 per 100 in miners. Since payments for disability due to silicosis are required, the reduction in the incidence of silicosis resulted in a similar reduction in payments.

These examples from Chile and Peru indicate that the cost of prevention of industrial disability is much less than the costs of payment for disabilities when no preventive and control program is in operation.

The only effective way to exploit the natural resources of a country is to ensure the well-being, productivity, and financial solvency of its people. Disability is a serious economic factor in production costs in industrial nations and is becoming so in less industrialized countries.

The benefits of occupational health programs are:

- a. Decreased labor costs by the reduction in wage losses, costs of illness, compensation costs, and costs for medical care.
- b. Decrease in sickness, injuries, labor turnover, and spoilage of materials.
- c. Improved efficiency.
- d. Improved morale among workers and better labor and public relations.
- e. The occupational health program, through prevention and control, costs far less than payments for disability when there are no such programs.

References

1. Bloomfield, J. J., The Importance of Occupational Health in the Economic Development of Latin America, (in publication) 1961.
2. Trasko, V. M., Silicosis, A Continuing Problem, Public Health Reports, Vol. 73, No. 9, Sept. 1958.

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RESERVE



SECTION

A. P. A. Holds Annual Meeting. The 120th Annual Meeting of the American Psychiatric Association will be held at the Biltmore Hotel, Los Angeles, Calif., during 4-8 May 1964. A Military Symposium in conjunction with this meeting will be held on 4, 5, 6, 7, and 8 May 1964. Each session will be at least two hours in duration. The Bureau of Medicine and Surgery will be represented by CAPT Ralph L. Christy MC USN and CDR Raymond C. Spaulding MC USN.

Particular reference will be made to problems of military psychiatry, including subjects of relevance to character and behavior disorders, problems

of adolescence, disciplinary problems, mental competency, and governmental psychiatric services.

By authority of the Chief of Naval Personnel, one retirement point may be credited to eligible Naval Reserve Medical Department officers in attendance. Eligible Naval Reserve Medical Department officers in attendance are requested to register with the Commandant's Representative so that attendance may be recorded and reported.

A. M. A. To Hold Annual Meeting. The Annual Meeting of the American Medical Association will be held in San Francisco, California, during 21-25 June 1964. A Military Symposium in conjunction with this meeting will be held on 22, 23, and 24 June 1964. Each session will be at least two hours in duration.

By authority of the Chief of Naval Personnel, one retirement point may be credited to eligible Naval Reserve Medical Department officers in attendance. Naval Reserve Medical Department officers are requested to register with the Commandant's Representative in order that attendance may be recorded and reported.

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Reservists Acclaim Training Program
at U. S. Naval Medical School, NNMC

The thirty-third Military Medical Training Program for Medical Department officers was presented by the U. S. Naval Medical School, NNMC, Bethesda, Md., from 8 to 20 March, 1964. The total enrollment was 188 officers from 36 states, the U. S. Army with 88, U. S. Navy 78, and U. S. Air Force 22. By Corps, the representation was Medical Corps 49, Dental Corps 43, Medical Service Corps 52, Veterinary Corps 2, and Nurse Corps 42—all members of the Reserves of their respective military departments.

The keynote address was delivered by the Honorable Shirley C. Fisk MD, Deputy Assistant Secretary of Defense (Health and Medical), Department of Defense, who spoke on "The Role Played by Reserves in the Armed Forces." RADM Calvin B. Galloway MC USN, Commanding Officer of the National Naval Medical Center, and CAPT John H. Stover, Jr., Commanding Officer of the U. S. Naval Medical School welcomed the Reserve Officers to the Center and the Medical School respectively.

This year's program contained extensive changes and updating of much material in the curricular planning and methods of presentation. As Course Director, CDR James J. Humes MC USN, Director of Laboratories of the U. S. Naval Medical School, with the assistance of an eminently capable faculty, presented an outstanding program which is receiving spontaneous acclaim from those who attended. One of the highlights of the meetings was the accent on changing patterns in military medicine generated by the explosive growth of sophisticated technologies and modern weapons systems. A broad range of other subjects, from medical problems on Polaris submarines to those of manned space flights were presented effectively, along with other diverse fields

such as modern therapy of tuberculosis and the applications of human tissue transplantation.

Deserving of high praise was the administrative supporting work of CDR George W. Wiese MSC USN, Administrative Officer of the Naval Medical School; Ensign E. N. Giard MSC USN, Administrative Assistant to CDR Humes; and HMCM H. M. Marshall USN, who handled a voluminous administrative work load in the countless but highly essential minutiae that go into the operation of a large training program of this type. To the NMS Staff and the course faculty alike—Well Done!

—Editor

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